

## CLAIM AMENDMENTS

1. **(Currently Amended)** A method of purifying wastewater, the method comprising the steps of:
  - (i) mixing a treatment agent with the wastewater in a mixing zone for a period of at least 2 minutes wherein the treatment agent is selected from the group consisting of an oxidising agent and/or anti-microbial agent, flocculating agent and foaming agent; and
  - (ii) subsequently passing the water through a foam fractionation zone to provide purified water.
2. **(Original)** The method of claim 1 wherein the water is passed through a flocculation zone prior to step (ii).
3. **(Original)** The method of claim 2 wherein the water remains in the flocculation zone for 2- 15 minutes.
4. **(Original)** The method of claim 3 wherein the water remains in the flocculation zone for 4-7 minutes.
5. **(Original)** The method of claim 1 including the step of ensuring the pH of the water falls within the range 6.5-8.5 pH.
6. **(Original)** The method of claim 5 including the step of ensuring the pH of the water falls within the range 6.5-7.5 pH.
7. **(Original)** The method of claim 1 wherein the mixing zone comprises one or more mixing columns.
8. **(Original)** The method of claim 1 wherein the oxidising agent is selected from the group consisting of chlorine in the form of hypochlorite, bromine in the form of hydrobromite, ozone, peroxyacetic acid and hydrogen peroxide.

9.     **(Original)** The method of claim 8 wherein the oxidising agent is selected from the group consisting of, chlorine in the form of hypochlorite and/or ozone.
10.    **(Original)** The method of claim 1 wherein the flocculating agent is selected from the group consisting of alum sulphate, polyaluminium chloride, ferric sulphate, ferric chloride and inorganic salt-polymer blends.
11.    **(Original)** The method of claim 1 wherein the foam fractionation zone comprises a fractionation column.
12.    **(Original)** The method of claim 11 wherein the rate of flow of water through the fractionation column falls within the range 1000-3400 L/min/m<sup>2</sup>.
13.    **(Original)** The method of claim 12 wherein the rate of flow falls within the range 2600-2800 L/min/m<sup>2</sup>.
14.    **(Original)** The method of claim 11 wherein water enters the fractionation column through a first water inlet located around the top of the column and a second water inlet comprising a gas injection means located around a base of the column.
15.    **(Original)** The method of claim 14 wherein gas injected into the second water inlet falls within the range of 20-50% of the total water flow through the second water inlet.
16.    **(Original)** The method of claim 1 wherein the water undergoes a second pass through the foam fractionation zone.
17.    **(Original)** The method of claim 1 including the step of measuring the pH of the wastewater on a continuous basis using an automated controller or microprocessor.
18.    **(Original)** The method of claim 1 including the step of adding an antimicrobial agent to the wastewater.

19. **(Original)** The method of claim 18 wherein the antimicrobial agent is selected from the group consisting of ultra violet light, and or iodine in the form of hypoiodite.
20. **(Original)** A system for purifying water, the system including a mixing zone comprising one or more mixing columns for mixing the water with a treatment agent and a foam fractionation zone for purifying the water, the foam fractionation zone in liquid communication with the mixing zone.
21. **(Original)** The system of claim 20 wherein the foam fractionation zone includes a foam fractionation column.
22. **(Currently Amended)** The system of ~~claim 20 and~~ claim 21 wherein the foam fractionation zone includes a foam height adjustment valve for varying the level of water within the foam fractionation column.
23. **(Currently Amended)** The system of ~~any one of claims 20, 21 and~~ claim 22 that further includes a flocculating column.
24. **(Currently Amended)** The system of ~~any one of claim 20 to~~ claim 23 that further includes a pH sensor and pH adjustment means.
25. **(Currently Amended)** The system of ~~any one of claim 20 to~~ claim 24 that further includes one or more treatment agent injection means.
26. **(Currently Amended)** The system of ~~any one of claim 20 to~~ claim 25 that further includes one or more water storage tanks.
27. **(Currently Amended)** The system of ~~any one of claim 21 to claim 26~~ wherein the foam fractionation column comprises:
- (i) a column body;
  - (ii) a column base;
  - (iii) a first water inlet located around the top of the column body;

- (iv) second water inlet located in the column base and including gas injecting means for introducing gas into said second water inlet;
- (v) a water outlet located in the column base;
- (vi) a foam formation zone located at the top of the fractionating column 5 above the first water inlet; and
- (vii) a foam compression zone located above the foam formation zone comprising a frusto-conical section and a foam outlet;

wherein the length of the column body is between 150-200% greater than the length of the column base, the diameter of the column base is at least 50% larger than the diameter of the column body and the base and body of the column are interconnected by a frusto-conical section, the edges of the frusto-conical section sloped at 45-80 degrees.

28. **(Original)** The system of claim 27 wherein the edges of the frusto-conical section are sloped at around 60 degrees.

29. **(Original)** The system of claim 22 wherein the foam height adjustment valve comprises:

- (i) a housing with a central bore positioned in the housing;
- (ii) one or more bushes positioned in the housing;
- (iii) a valve stem threadably engaged with the bushes;
- (iv) a handle located at a proximal end of the stem;
- (v) a valve located at a distal end of the stem; and
- (vi) a least one or more air pathways located in the bushes and adapted to provide communication between external air and an internal space of a conduit to which the valve assembly is attached.

30. **(Original)** A foam fractionation column comprising:

- (i) a column body;
- (ii) a column base;
- (iii) a first water inlet located around the top of the column body;
- (iv) a second water inlet located in the column base and including gas injecting means for introducing gas into said second water inlet;

- (v) a water outlet located in the column base;
- (vi) a foam formation zone located at the top of the fractionating column above the first water inlet; and
- (vii) a foam compression zone located above the foam formation zone comprising a frusto-conical section and a foam outlet;

wherein the length of the column body is between 150-200% greater than the length of the column base; the diameter of the column base is at least 50% larger than the diameter of the column body and the base and body of the column are interconnected by a frusto-conical section, the edges of the frusto-conical section sloped at 45-80 degrees.

31. **(Original)** The foam fractionation column of claim 30 wherein the edges of the frusto-conical section are sloped at around 60 degrees.

32. **(Currently Amended)** The foam fractionation column of ~~claim 30 and~~ claim 31 further including a foam removal apparatus, the foam removal apparatus comprising:

- (i) a discharge conduit in communication with the foam outlet of the foam fractionation column;
- (ii) a spray nozzle housed within the conduit, the spray nozzle in liquid communication with a motive flow source; and
- (iii) at least one or more air pathways located in the conduit to provide communication between external air and an internal space of the conduit.

33. **(Original)** A valve assembly for varying the level of water within a foam fractionation column, the valve assembly comprising:

- (i) a housing with a central bore positioned in the housing;
- (ii) one or more bushes positioned in the housing;
- (iii) a valve stem threadably engaged with the bushes;
- (iv) a handle located at a proximal end of the stem;
- (v) a valve located at a distal end of the stem; and
- (vi) a least one or more air pathways located in the bushes and adapted to provide communication between external air and an internal space of a conduit to which the valve assembly is attached.

34. **(Original)** The valve assembly of claim 33 wherein the one or more bushes comprise two spaced bushes.

35. **(Currently Amended)** The valve assembly of claim ~~33 or claim~~ 34 in liquid communication with the foam fractionation column of claim 30.